

REMARKS

In the Office Action, claims 1-4, 7-11, 13-17 and 20-23 were rejected, claims 5, 6, 18 and 19 were objected to, and claims 12 and 24 were allowed. The drawings were objected to because of Figures 4 and 5 and the hand-written page numbers above all the drawings. By the present Response, claims 1, 12, 13 and 24 have been amended and drawings have been replaced. Upon entry of the amendments, claims 1-24 will remain pending in the present patent application. Reconsideration and allowance of all pending claims are respectfully requested in view of the arguments summarized below.

Objection to the Drawings

The drawings were objected to because Figures 4 and 5 were not considered suitable for publication. Moreover, the Examiner also objected to the hand-written page numbers above all the drawings. Figures 4 and 5 have been replaced to obviate the objections raised in the Office Action. Review and acceptance of the replacement drawings are requested. The hand-written page numbers do not appear in the applicants' file copies of the drawings. To the extent that the application has already been published, Applicants request that the objection be withdrawn.

Objections to the Claims

The Examiner objected claims 1, 12, 13 and 24 due to certain informalities set forth in the Office Action. By the present response, claims 1, 12, 13 and 24 have been amended to more clearly define the meaning of "cyclically" and "cyclic" with respect to the cyclically moving object in a subject to be imaged. This object or its cyclical movement, it is believed, will not be confused with any other object. Accordingly, it is believed that the claims are sufficiently clear and precise.

Rejections Under 35 U.S.C. § 102

In the Office Action, claims 1-4, 8-10, 13-17, 21 and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Horiuchi, U.S. Patent No. 5,991,356. *A prima*

facie case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. *In re Donohue*, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Applicants respectfully assert that the present invention, as recited in independent claims 1 and 13 is patentable over the Horiuchi reference.

Independent claims 1 and 13 recite, *inter alia*, the collection of three-dimensional images being temporally filtered on a pixel by pixel basis. As the application describes, temporally filtering the collection of three-dimensional image is useful to minimize artifacts in the individual volumetric reconstructions. The collection of volumetric reconstructions may then be used to generate visualizations of the cyclically moving object characterizing the periodic motion. (See, page 8, paragraph 20, lines 24-28).

The Horiuchi reference discloses a technique for obtaining a tomographic image, such as of the heart, and an apparatus to enable the technique. Additionally, Horiuchi discloses scanning a heart with a CT imaging system having a detector array and a rotating gantry, performing image reconstruction on the acquired data with the centrally weighted location for a phase, sequentially shifting the centrally weighted location and reconstructing again so as to generate tomographic images of the heart at various phase. (see, column 4, line 54-column 5, line 23; see, also, column 10, line 59-column 11, line 57, cited by the Examiner).

However, Horiuchi fails to disclose temporally filtering of the collection of three-dimensional images on a pixel by pixel basis as claimed. The Examiner relied upon a passage from Horiuchi to support this rejection. The passage reads:

If the scan and image reconstruction procedure shown in FIG. 12 is sequentially performed at a plurality of slice locations, a tomographic image at each phase can be imaged at each of the plurality of slice locations. In this case, for example, the R wave (a wave which forms the maximum peak) in the ECG signal can be used as a scan trigger to facilitate aligning of the phases through the plurality of slices.

Tomographic images for a plurality of slices at an identical phase can be used to construct a reformation image for an arbitrary slice or a three-dimensional image at every phase. (*see*, column 10, lines 52-62)

The passage clearly does not support any contention that the tomographic images in Horiuchi are being temporally filtered. For that matter, the passage does not even suggest any filtering technique to be applied on the tomographic images, and certainly not temporal filtering on a pixel by pixel basis.

At least because Horiuchi do not disclose or suggest temporally filtering of the collection of three-dimensional images as claimed, the reference cannot support a *prima facie* case of anticipation of claims 1 and 13. Claims 2-4 and 8-10 depend directly or indirectly from claim 1. Claims 14-17 and 21-22 depend directly or indirectly from claim 13. Accordingly, the Applicants submit that claims 2-4, 8-10, 14-17 and 21-22 are allowable by virtue of their dependency from allowable base claims. Applicants also submit that the dependent claims are further allowable by virtue of the subject matter they separately recite. Thus, it is respectfully requested that the rejection of claims 1-4, 8-10, 13-17 and 21-22 under 35 U.S.C. §102(b) be withdrawn.

Rejections Under 35 U.S.C. § 103

Claims 7, 11, 20 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horiuchi in view of Tuy, U.S. Patent No. 5,243,664.


At least because the Horiuchi reference, as discussed above, fails to teach or suggest temporally filtering of the collection of three-dimensional images, and as the Tuy reference was not argued to do so, the Applicants submit that a *prima facie* case of obviousness is not supported against claims 7, 11, 20 and 23 for rejection under 35 U.S.C. § 103(a). Thus, it is respectfully requested that the rejections of claims 7, 11, 20 and 23 under 35 U.S.C. §103(a) be withdrawn.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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IN THE DRAWINGS

Please replace page 3 of the drawings as originally filed with the attached replacement page. Applicants respectfully submit that the present replacement page do not add any new matter to the application.